

Application No. 10/781,226

GG01

REMARKS

Claims 1-28 were pending in this case.

Claims 1-28 were rejected. Claims 1-28 were rejected under 35 U.S.C. §103(a), as being unpatentable over *Gorin* (US Pat. No. 6,112,696) in view of *Okumura* (US Pat. No. 6,267,074).

The Examiner stated that:

Gorin teaches the claimed multiple plasma chambers, see figures 1-3, but does not specifically mention control of backpressure from the chambers to the gas source. The patent to *Okumura* is applied for teaching the same as conventional, note gate valve 4. Use of the same effect more pressure control of the plasma, which is beneficial. In view of this teaching it would have been obvious to modify the *Gorin* system with back flow prevention means for the inlet gas flow, to effect a processing having more control of the chamber output plasma flow. As per dependent claims note figure 3 showing two input flows into a single chamber and figure 2 which shows a cascaded flow from into chamber into another, i.e., series and parallel combinations.

The Examiner's rejection is respectfully noted and traversed for the reasons discussed below.

Okumura (US Pat. No. 6,267,074) discloses a low-pressure plasma system with magnetic confinement (see Column 8 line 30 through Column 9 line 15) that requires an operating pressure typically between 5 to 50 milliTorr for successful magnetic confinement of the plasma. This is a very restricted operating pressure environment compared to the higher operating pressure environment of *Gorin* (US Pat. No. 6,112,696), where, for example, an operating pressure of 1 to 3 Torr is used (see Column 2 line 43 and in Column 3 line 50). In other words, these two references are operationally incompatible with each other due to an operating pressure difference of almost 1000 times (almost three orders of magnitude). Those skilled in the art would consider the combination of these two references to be inoperable, and even mutually exclusive. The two cited references are also individually complete functional systems, so there would be no reason to use parts from or add or substitute parts to either reference.

Furthermore, in *Gorin* (US Pat. No. 6,112,696), any gas back diffusing from the downstream chamber will first have to cross the high power density part of the plasma and be dissociated before proceeding any further. The back diffusion in this case will be a back diffusion of dissociated gas, not an un-dissociated gas diffusion controlled by the manually-controlled gate valve 4a and the motor-controlled gate valve 4 disclosed in *Okumura* (US Pat.

Application No. 10/781,226

GG01

No. 6,267,074) (see Column 2 lines 1-10). Therefore, these references take different approaches that are mutually exclusive, so a combination would be unlikely to one skilled in the art.

Furthermore, *Okumura* (US Pat. No. 6,267,074) discloses a plasma system to control the ratio between the radical species and ion species (see Column 14 lines 1-34), which is a different objective than the plasma system of *Gorin* (US Pat. No. 6,112,696), which is aimed at maximizing the reactive ionic species, even at low power (see Column 4 lines 1-7). Therefore, these references have different aims, so a combination of these references would be unlikely to one skilled in the art.

Thus, *Gorin* (US Pat. No. 6,112,696) and *Okumura* (US Pat. No. 6,267,074) do not make obvious the method to produce a higher power density downstream plasma as recited in independent claims 1 and 8, and thus do not make unpatentable the invention of independent claims 1 and 8 under 35 U.S.C. §103(a). In view of the discussion above, Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. §103(a) rejection of independent claims 1 and 8.

Dependent claims 2-7 are also respectfully submitted to be patentable, for at least the same reasons discussed above with respect to independent claim 1.

Dependent claims 9-13 are also respectfully submitted to be patentable, for at least the same reasons discussed above with respect to independent claim 8.

Amended independent claims 14 and 20 have been amended to clarify and distinguish the operating pressure of the apparatus of the present invention compared to the lower operating pressure used in *Okumura* (US Pat. No. 6,267,074).

Thus, *Gorin* (US Pat. No. 6,112,696) and *Okumura* (US Pat. No. 6,267,074) do not make obvious the apparatus to produce a higher power density downstream plasma as recited in amended independent claims 14 and 20, and thus do not make unpatentable the invention of amended independent claims 14 and 20 under 35 U.S.C. §103(a). In view of the discussion above, Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. §103(a) rejection of amended independent claims 14 and 20.

Dependent claims 15-19 are also respectfully submitted to be patentable, for at least the same reasons discussed above with respect to amended independent claim 14.

Application No. 10/781,226

GG01

Dependent claims 21-28 are also respectfully submitted to be patentable, for at least the same reasons discussed above with respect to amended independent claim 20.

Therefore, the cited references should not make claims 1-28 obvious and unpatentable under 35 U.S.C. §103(a).

In view of the discussion above, Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. §103(a) rejection of claims 1-28.

No new matter is introduced by the amendments. In view of the preceding amendments and the remarks, Applicant respectfully requests reconsideration of the application.

SUMMARY

In conclusion, claims 1-28 are pending in this application. Independent claims 14 and 20 have been amended to clarify the present invention in response to the Examiner's rejection. Applicant respectfully requests that the Examiner withdraw the rejections of the pending claims and pass the application to issue.

Applicant's undersigned attorney can be reached at (408) 374-7035. All correspondence should continue to be directed to the address previously indicated.

Respectfully submitted,



Kevin Roe
Reg. No. 40,148

Dated: December 2, 2005